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Section F.—Veterinary Hygiene

(*Continued from* p. 935.)

[From our own Correspondent]

The Section resumed its deliberations on Friday, the 15th, with consideration of a paper on "The Duties of a Whole-time County Veterinary Officer," presented by Captain R. Simpson, F.R.C.V.S., D.V.S.M., Veterinary Officer, Cumberland C.C. Again in the paper one could perceive a tending towards that regional administration of veterinary public health matters already noticed.

Duties of a Whole-Time County Veterinary Officer

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The years which have intervened between the commencement of this century and the present time have witnessed a definite tendency in the sciences towards specialisation. Probably in no branch of science has this tendency been more marked than in medical science, where the development of research and the ever-increasing knowledge resulting from research have led definitely to the evolution of specialists in the various branches of human medicine and surgery. In particular, the development of public health administration in the early part of the century inevitably led to the necessity for graduates in medicine to become specially trained for this particular work, and it was not long before it became obvious that their duties required not only a practical knowledge of public health matters, but also a large measure of administrative training. Modern developments in the public outlook on health matters soon led to a great increase in the amount of work which local authorities were required to undertake, and both on these grounds and for reasons of economy, all the larger local authorities in the country soon found it necessary to maintain their own staff of medical officers of health, who were required to devote their whole time to their official duties.

The veterinary profession has been passing through a similar phase during the last few years. The development of legislation in connection with the meat and milk supplies in this country, coupled with the more advanced and progressive campaign which is being waged against contagious animal disease in Great Britain, has inevitably led to a greater call for specialisation in the graduate who intends to take up duties in this type of work.

The Royal College of Veterinary Surgeons realised this tendency, and has acknowledged its obligations to provide the administrative services of the country with veterinary surgeons adequately trained to undertake the veterinary duties which recent legislation has imposed on local authorities. A post-graduate diploma in Veterinary State Medicine was instituted in 1920, the syllabus for which is equal in scope to that prescribed for the Diploma in Public Health. Furthermore, the development of veterinary science in all its various branches has led the Royal College of Veterinary Surgeons to extend its course of instruction so that the prospective graduate in veterinary medicine and surgery must in future attend a mimimum of five years at one of the recognised colleges in Great Britain and Ireland.

The veterinary graduate of to-day, and more particularly will it be true of the future, is thoroughly trained in the basic sciences, and also in pathology, epizootiology, meat and milk inspection, and general preventive veterinary medicine, and is thus well fitted to undertake the control of contagious animal disease, and to take a full share in the administrative control of the meat and milk supplies of this country.

The development of local veterinary administrations has been of slow growth, much impeded by prejudice, and still more by failure of the general public to realise the extensive scope of the training and knowledge which has to be acquired by the modern veterinary graduate. The larger municipalities led the way in setting an example of the value to be obtained from a properly organised veterinary department. To these areas also belongs the credit of recognising the necessity for organising efficient systems of meat and milk inspection under veterinary supervision, but the work of these departments has been isolated and their value to some extent restricted through lack of similar methods in rural areas. It is becoming increasingly realised that any system of control of meat and milk cannot be concentrated in urban areas, but that for the future the only sound policy is for both urban and rural areas to co-operate, so that there should be no dissipation of effort, nor, on the other hand, unnecessary overlapping.

The establishment of county veterinary

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departments has been a matter of comparatively recent development, particularly in so far as England and Wales are concerned. To Cumberland, the county which I represent, belongs the distinction of being the first county area in England and Wales to appoint a whole-time veterinary officer to discharge all the duties laid upon the County Council by the Diseases of Animals Acts and Orders. This appointment was made in 1912. Perhaps in this way the county atoned for its apparent delay to set a proper value on the need for an organised public health department, as it was one of the last counties in England to appoint a full-time medical officer of health.

Scotland, however, was still more advanced so far as the appointment of whole-time veterinary officers is concerned, in that Lanarkshire made such an appointment in 1910. Progress in Scotland in the establishment of veterinary administration has been much more rapid than in England, owing to the special provisions of the Milk and Dairies (Scotland) Act of 1914, which makes it practically compulsory for the larger stock populated areas to maintain at least one whole-time veterinary officer.

A period of twelve years elapsed after 1912 before any further whole-time appointments were made in England and Wales, but since 1925 a considerable number of counties have set up veterinary departments adequately staffed to discharge all the veterinary duties imposed on county councils by recent legislation.

There are essential differences in the legislation affecting the control of meat and milk inspection in Scotland, as compared with England and Wales, and I propose therefore to deal with my subject from the point of view of a county veterinary officer who has to work in a district of England and Wales.

In consequence of the fact that the regulations which he has to administer are issued by two separate Government departments, namely, the Ministry of Agriculture and the Ministry of Health, it follows that the county veterinary officer in England and Wales finds himself responsible for his work to at least two separate committees of his county council. The Ministry of Agriculture Act of 1919 authorised the setting up of agricultural committees to which county councils were authorised to delegate their powers in regard to the Diseases of Animals Acts and Orders, and these agricultural committees were further empowered to set up executive committees for the administration of these Acts and Orders. In so far, therefore, as the control of animal disease is concerned in connection with regulations made by the Ministry of Agriculture, the county veterinary officer is directly responsible to the diseases of animals sub-committee. On the other hand, all legislation in regard to the inspection of milk and dairies, being issued by the Ministry of Health, is naturally relegated to public health committees to which the veterinary officer is again responsible for any veterinary duties which may devolve on the county council as the result of such legislation.

Such an arrangement is far from satisfactory, owing to the fact that so many of the regulations issued by the two Government departments referred to have a tendency to overlap. For example, the administration of the Milk and Dairies (Consolidation) Act of 1915 and the Milk and Dairies Order of 1926, is closely linked up with the working of the Tuberculosis Order. It is thus extremely desirable that the diseases of animals committees should not be completely shut off from participation in the control of work which is so closely associated with the general question of animal health, and some system of co-operation between these committees has always appeared to me desirable in order to get over the present difficulty of overlapping legislation.

In Cumberland an attempt to solve this difficulty has been made by the formation of a milk and dairies sub-committee, to which the veterinary department is responsible for all work necessitated by the operation of the Milk and Dairies (Consolidation) Act, 1915, the Milk and Dairies Order of 1926, and the Milk (Special Designations) Order of 1923. This special sub-committee is formed of an equal number of representatives of the health and diseases of animals sub-committees, the chairman being the chairman of the agricultural committee. Such an arrangement makes for a continuation of the interest of the diseases of animals committee in matters affecting the control of milk supplies in the county and the general protection of the public health from disease of animal origin. The co-operation of the medical officer of health is also maintained throughout, by his attendance at meetings of the milk and dairies sub-committee, and also by the fact that the minutes and reports of the sub-committee are always laid before the health department as well as the agricultural committee. Local arrangements of this nature are only necessitated to avoid overlapping in administration. Such arrangements would be quite unnecessary if there was one central State department dealing entirely with all questions relating to animal health and the inspection of all animal food products.

From the foregoing, it will be realised that the work of the county veterinary officer falls into two sections: first of all the administration of the Diseases of Animals Acts and Orders, and, secondly, the carrying out of such inspections of dairy herds as are required by the Milk and Dairies Order, 1926, and the Milk and Dairies (Consolidation) Act, 1915.

So far as the Diseases of Animals Acts and Orders are concerned, general control is maintained by the diseases of animals division of the Ministry of Agriculture, whose veterinary staff is responsible for dealing practically entirely with the diagnosis and control of certain of the scheduled animal diseases, foot-and-mouth disease, for example, and swine fever. The local authorities are only concerned in the maintenance and control of movement of animals and the general maintenance of restrictions imposed by the Ministry's Orders in connection with these two particular diseases. In regard to other scheduled diseases, control is effected partly by the local authority and partly by the Ministry of Agriculture, while, in a few diseases, control is maintained entirely by the local authority. Thus the whole-time veterinary officer in a county finds himself continually engaged in the routine diagnosis of anthrax, sheep scab, parasitic mange, and tuberculosis. Certain other diseases which are scheduled, *viz.*, glanders, rabies, epizootic lymphangitis, cattle plague, and pleuro-pneumonia, have at the moment been eradicated from this country, and the veterinary profession may legitimately take pride in this achievement.

The whole-time officer in a rural area has also to undertake the inspection of livestock in markets and exercise general supervision of the cleansing and disinfection of these places. He is also concerned in the administration of orders and regulations relating to the transit of animals in his area, and with the Importation of Animals Orders issued by the Ministry of Agriculture. The bulk of the work, however, in connection with the licensing of imported animals and their temporary detention, the transit of livestock by road and by rail, must, in rural areas, largely be shared by the police, who also are necessary in the administration of sheep dipping regulations. In large rural areas such as in Cumberland, police co-operation is essential, and close contact and confidence must be maintained between the chief constable and the head of the local veterinary administration if the best results are to be obtained in the general administration of the Diseases of Animals Acts and Orders.

The working of the Tuberculosis Order in rural areas, especially in those areas with a large dairy herd population, constitutes an important part of the veterinary officer's duties. The scope and object of the Order have been fully detailed and discussed in a paper read before this section of the Institute two years ago, and it is only necessary here to reiterate the fact that the Order was never intended to effect the eradication of bovine tuberculosis, but that it was designed first of all as a public health measure, to enable us to get rid of animals which are a source of danger to the milk supply, and, secondly, to get rid of cases which are grossly affected with the disease and therefore liable to be a probable source of spread of tuberculosis on a large scale. By itself, the Order is not likely to have any permanent effect in reducing the incidence of bovine tuberculosis.

It is essential that it should be combined with the powers given in the Milk and Dairies Acts and Orders. In other words, clinical examinations with a reasonable amount of milk sampling are necessary to obtain the best possible results from the Tuberculosis Order. The county veterinary officer is responsible for the whole administration of this Order, both in regard to diagnosis and the disposal of the carcasses of animals slaughtered under the Order, subject to the provision in the Tuberculosis Order, No. 2, which requires that all meat from animals slaughtered under the Order and intended for human consumption must be submitted to inspection by the sanitary authority concerned.

In England and Wales the provision made for the clinical examination of dairy herds is of an unsatisfactory nature, as there is no compulsion on *all* local authorities to carry out these clinical examinations, although a good many authorities have now decided on the necessity of carrying out this work. In Scotland, the position is on a much more satisfactory basis, and clinical examinations of dairy herds twice a year are now obligatory. In the county of Cumberland, routine herd inspection has been developed progressively since the introduction of the Milk and Dairies Order of 1926. The work, however, is restricted to a large extent to the milk-producing herds in the area on account of limitations of staff and the large area to be covered. These clinical examinations, which are carried out once or twice annually, are supplemented by a system of bulk sampling of milk supplies in the county area, and this sampling is further supplemented by a small amount of similar work done by the sanitary authorities. The satisfactory effect of this work is being shown by the marked decrease in the number of complaints received from areas outside Cumberland in regard to tuberculous milk, and generally also in regard to the comparatively small incidence of tuberculous milk in this county, as compared with other districts. During the last three years, on the average, 2 per cent. of the samples taken in the county were found to be tuberculous. This percentage is considerably below the figures which have been published in regard to other areas.

Much evidence has accumulated in different parts of the country indicating the value of periodical dairy herd examinations, not only on account of its public health aspect, but also

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on account of its value in detecting clinical cases of tuberculosis at a relatively early stage. The value of the veterinary officer's work cannot be properly and fully assessed merely on the number of diseased animals found. A large part of his work should, in fact, be of an educative nature if any real and lasting good is to follow. There is undoubtedly still much lack of knowledge amongst agriculturists as to the nature of tuberculosis, its method of spread, and also in regard to the elementary rules of prevention of this disease. It follows, therefore, that the veterinary officer engaged in routine examination can, if he interprets his duties properly, lend valuable aid in educating farmers in regard to general methods of prevention.

The present position of county veterinary services in England and Wales in regard to the supervision of the housing of dairy herds and the general question of sanitation of cowsheds is far from being satisfactory. The division of duties under the Milk and Dairies Order of 1926 causes a good deal of overlapping, besides leading to lack of uniformity, and the whole of the administration of this Order would be much better concentrated under county councils.

With the position, however, as it is, it is exceedingly desirable that the veterinary department of a county council should maintain the closest possible co-operation with the sanitary authorities. It is only in this way that the Order can be effectively administered.

The provisions of Section 4 of the Milk and Dairies (Consolidation) Act of 1915 impose on county authorities the duty of dealing with complaints in regard to tuberculous milk supplies. The majority of such complaints come from urban areas where regular testing of milk by biological methods is carried out. It is definitely the case, however, that where routine examinations of dairy herds are carried out the frequency of such complaints has considerably decreased. The protection afforded by such sampling is a valuable one, but it is unsafe to rely mainly on sampling without in addition having some reasonable system of clinical inspection of dairy herds. Milk sampling must, however, in my view, occupy a definite place in any campaign against tuberculous milk, and the protection of the milk consumer against infection. It is not sufficient that such work should only be carried out in the larger urban areas; the rural and small urban areas are equally entitled to be safeguarded.

Apart from this consideration, the marked tendency in recent times for large quantities of milk to be bulked at depôts before dispatch to urban areas raises a doubt as to the value of sampling milk from such depôts, owing to the difficulty of tracing the source of infection when a large number of producers' farms are involved, possibly in the area of different local authorities. An instance of this nature came recently under my notice, where the milk of a depôt drawing supplies from over 800 farms was found to be tuberculous. Cases of this kind point to the necessity of concentrating the sampling on the sources of supply before bulking takes place, but if this is to be done by producing areas for the benefit largely of milk consumers in urban areas, obviously it is unfair to saddle the producing area with all the expense involved. Such expenditure should be a national charge, or at least shared by the authorities which benefit.

In Cumberland, a large number of bulk samples of milk are taken by the county council annually for examination for tubercle, and these samples are further submitted to an examination in regard to their general bacteriological content. The sanitary authorities are encouraged to undertake a share of such work, but progress in this direction has been slow. The samples are concentrated on the milk consumed in the county. The improvement effected in regard to the general cleanliness in the milk produced and consumed in this county has been noteworthy in the last few years as a result of the milk sampling and general inspection of herds. Whereas in 1929, only 33 per cent. of the samples examined reached Grade A standard, in 1931, 70 per cent. were found to reach this standard. This improvement has been effected largely by the educative work carried out by the veterinary department in the course of inspections of herds. The main causes of contamination found have been dirty cows and failure to clean the udders before milking.

An unsatisfactory state of affairs exists in regard to the administration of the Milk (Special Designations) Order of 1923. County councils are only responsible for the issue of Grade A licences. The licences for other higher grades of raw milk are issued by the Ministry of Health. The number of licensed herds under this Order is far short of what should be the case, and, in my view, a greater impetus would be given to the establishment of tuberculin-tested herds if the whole administration of this Order were invested in county council's and county boroughs. In my district the control and inspection of Grade A herds are in the hands of the veterinary department.

The position of the veterinary surgeon in England and Wales in regard to meat inspection is thoroughly unsatisfactory, and it has been the subject of adverse criticism at many meetings of this section of the Royal Sanitary Institute. Resolutions have been passed drawing attention to the necessity for fully qualified persons being appointed to carry out efficient inspection of all animals slaughtered for human consumption, but at the moment there is no evidence of any awakening of the public to the

true position in regard to meat inspection in this country.

The abolition of the private slaughterhouse is an essential step towards improvement of our general system of meat inspection, and until this is effected, it is difficult to see how the consumption of considerable quantities of unsound meat is to be avoided. In the majority of rural areas there is no system of meat inspection worthy of the name. The veterinary officer of a county council, and, indeed, the veterinary surgeon generally, has no official standing in regard to meat inspection in England and Wales, and his specialised training is seldom made use of in rural districts. Much valuable information in relation to the incidence of disease, especially tuberculosis, is completely lost at the present time through the failure to co-ordinate meat inspection with the general question of the control of animal disease throughout the country.

The preparation of reports and the compilation of statistical information for the consideration of the appropriate committees of the county council are an important aspect of the whole-time veterinary officer's duties. Such reports form a permanent local record in regard to animal disease, besides offering an opportunity of reviewing the nature and scope of the work carried out in the district.

Laboratory diagnosis is an essential part of the whole-time county veterinary officer's work. A considerable amount of time has to be devoted to the microscopical examination of milk from cows suspected to be affected with tuberculosis of the udder. A large proportion of tuberculous udders are diagnosed in this way, without incurring the delay consequent on carrying out biological tests, which, of course, necessitate resort to a properly equipped pathological laboratory.

In the opening remarks in this paper, reference was made to the marked tendency in recent years to relegate public veterinary duties to whole-time officers. Such a movement has undoubtedly touched on the work of the private veterinary practitioner who was employed in a part-time capacity to carry out specific veterinary duties imposed on county councils. The increased work, however, imposed on local authorities by recent legislation has made this movement inevitable, and there can be no doubt, from an administrative point of view, that there are many advantages apparent in having at least one whole-time veterinary officer in counties which have a sufficient area to justify such an appointment.

As regards the future development of the public veterinary services of this country, it is difficult to resist the conclusion that, in order to avoid existing dissipation of effort and overlapping, some reorganisation of these services is necessary. Differences of opinion undoubtedly may exist as to how this is to be achieved, but essentially there would appear to be a good case for the establishment of one central department to deal on broad, comprehensive lines with all questions relating to animal health and animal food products. Such a development may not come in the near future, but, at any rate, it does seem desirable that consolidation of the existing legislation affecting animal health and animal food products should be effected as soon as possible, with a view to securing simplicity and the removal of the numerous anomalies which at present exist, and which, to some extent, prevent county authorities from making the fullest possible use of a properly organised public veterinary service.

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The paper was well received and its discussion was opened by that veteran among county veterinary officers, Mr. H. Begg, of Lanarkshire, who differed from Captain Simpson in some matters. In particular, he found that in any recasting of the administrative service some advantages may be lost.

Professor Share-Jones discussed the subject in a vigorous manner, and, as was to be expected, he mentioned national animal insurance and expiated on the advantages to the whole country to be gained from it.

A sanitary inspector here joined in, and it was obvious from his remarks that he had been taught to believe that pasteurised milk was the only class of milk which could be recommended to the public as a "safe" milk. At least, it strengthened the suggestion that interested persons are stampeding medical officers of health and sanitary inspectors into that mental position.

The discussion continued on the milk question.

Lieut.-Colonel C. W. Cohen, C.M.G., claimed for Grade A milk an equal status with Grade A (T.T.) and Certified Milk as regards its greater freedom from tubercle bacilli, and incidentally he amazed the meeting by trying to demonstrate that part-time veterinary inspectors were to be preferred to whole-time inspectors for the examination of dairy cows.

Lieut.-Colonel Marrett, M.O.H., Jersey, returned to pasteurised milk, using the arguments in its favour employed by most medical officers of health, and entirely disregarding the merits of sound, clean, raw milk.

He was followed by a sanitary inspector from Stroud, who pleaded for co-ordination of effort in improving the milk supply. It was obvious, however, from his remarks, that what was required in Gloucestershire and the West of England was not co-ordination but that the county councils should make a start to supervise and control the herds of dairy cows and other cattle.

Dr. Macnab, M.O.H., Stafford, made a very useful contribution by supporting Captain Simpson's view that pasteurised milk was not the absolutely safe milk it is supposed to be by many medical officers of health, and quoted instances of the finding of tubercle bacilli in pasteurised milk. He urged that Grade A (T.T.) and Certified milk should be more widely made known to the public.

Captain Simpson made suitable reply to the observations raised on his paper, and we proceeded to discuss "The Supervision and Control of Milk-producing Animals and what it means to the Public," introduced by Captain F. W. Medlock, m.r.c.v.s., Chief Veterinary Officer, Surrey C.C.

In introducing his paper Captain Medlock made some amplifications and gave us some valuable figures in support of his contentions.

The Supervision and Control of Milk-producing Animals and what it means to the Public

F. W. MEDLOCK, M.R.C.V.S.
Chief Veterinary Officer, Surrey

During recent years much has been written about milk and a good deal of propaganda work has been done to encourage the consumption of milk. Without going into the question as to whether cows' milk is, or is not, beneficial to the human subject, the public have a legitimate right to obtain, on demand, a pure, unadulterated, free-from-disease article. Does the public always obtain this article? Unfortunately the answer is "No." A farmer whose trade is to produce milk for human consumption from his cows is in a broad sense primarily responsible for the article he sells to the public, but surely the public should have a reasonable guarantee that they are receiving a clean, healthy, raw milk.

The means by which the milk consumer can be safeguarded is partly answered by present-day legislation and partly by the action of many well-intentioned, conscientious farmers who take practical steps to prevent milk, which is, in their opinion, not fit for human consumption, from being sold to the public.

The bacterial diseases of bovine animals which are communicable to man are as follows: tuberculosis, anthrax, contagious abortion, rabies, cow-pox, actinomycosis, and foot-and-mouth disease.

There are other diseases of non-bacterial origin. The human diseases with which cows may become infected and pass back again to man are: scarlet fever, septic throat, and diphtheria.

Comparing the relative importance of these to man, tuberculosis outranks all the other diseases and gives more trouble than all the other diseases combined. In point of importance septic sore throat comes second and from time to time is responsible for large epidemics. Cows affected with contagious abortion may be the cause of recurrent fever in man, the infection being conveyed by the milk from such animals; and anthrax by reason of its infrequency is last in importance. Glanders is not a disease of bovines but of horses, and is also communicable to man. Fortunately it is now rarely met with.

TUBERCULOSIS

As already stated, tuberculosis is at the present moment by far the most serious of the diseases communicable from animals to human beings, and there is little doubt that the present incidence of bovine tuberculosis and of human tuberculosis of bovine origin is most unsatisfactory.

Time was when those in authority were at variance in their opinions as to whether bovine tuberculosis was, or could be communicated to the human subject. Of late years the evidence that the bovine type of tubercle bacillus is pathogenic to human beings is overwhelming.

As far back as 1901 it was a fair assumption from evidence at hand and in the absence of evidence to the contrary that the bovine tubercle bacillus had a high degree of pathogenic power for man. Also, that this was specially manifest in the early years of life. Many writers have recently worked out the actual number of deaths due to the bovine tubercle bacillus.

In 1922 Corbett collected all cases of tuberculous infection occurring at all ages in England and Wales and found that 7 per cent. were due to the bovine bacillus.

In 1923 Gordon and Brown found the bovine organism ten times among thirty children under twelve years of age.

Further, Griffith found that in England in 1920, 27·33 per cent. of tuberculosis in children up to sixteen years of age was of bovine origin, and Savage found that tuberculous cervical glands in children were of bovine origin in over 50 per cent. of cases, while in children under fifteen years over 50 per cent. of lupus was bovine.

The time has surely arrived when concerted and determined action should be taken with regard to this grave menace to the public health, particularly the younger generation.

It has been the writer's experience to have been told by medical men and others that children taking small doses of living bovine tubercle bacilli have thereby raised their specific resistance to tuberculosis without producing the disease.

Would these scientific men allow their own children to be fed with milk known to contain living bovine tubercle bacilli? If they did, they would be guilty indeed. If they would not, then they should try and find a more scientific argument.

It is further estimated that 40 per cent. of the cows in our dairy herds producing milk for human consumption are tuberculous. Surely these are circumstances calling for national attention.

How does the bovine tubercle bacillus get into the milk? There are three ways:—

(1) Directly from the udder of the cow;
(2) by contamination by cow dung; and
(3) by contamination by infected sputum.

As regards (1) a cow suffering from tuberculosis of the udder will excrete tubercle bacilli in her milk. In cases under (2) a cow infected with pulmonary tuberculosis swallows part of the expectorate which, passing along the alimentary canal, is passed out with the fæces. Its actual entry into the milk may be in the form of dried excreta from the animal's coat and tail while milking is in progress or by the milker's hands, clothing, etc. Regarding (3) it seems reasonable to suppose that infected sputum might gain access to the milk in the form of dust, especially as examination of sputum from animals affected with pulmonary tuberculosis has revealed the presence of large numbers of tubercle bacilli. The amount of fæcal matter that milk will dissolve without apparent sign of such pollution is quite large, and it is on record that even apparently healthy cows pass in their fæces tubercle bacilli pathogenic to guinea-pigs.

LEGAL PROVISIONS

Two Government departments have, within recent years, make enactments for dealing with bovine tuberculosis, first, as affecting human beings and, secondly, as affecting animals.

Put very shortly, it is an offence for a farmer to:—

(*a*) sell for human consumption or for use in the manufacture of products for human consumption; or
(*b*) use or suffer to be used in the manufacture of products for human consumption

the milk of any cow which has given tuberculous milk or is suffering from any of the following diseases:—emaciation due to tuberculosis; tuberculosis of the udder; acute inflammation of the udder; acute mastitis; actinomycosis of the udder; anthrax; foot-and-mouth disease; suppuration of the udder; comatose condition; septic condition of the uterus; and any infection of the udder or teats which is likely to convey disease.

Further, the owner or person in charge of a bovine which he suspects to be suffering from emaciation due to tuberculosis, tuberculosis with chronic cough, tuberculosis of udder or any chronic disease or induration of the udder, must notify a local authority of such suspicion.

Although stockowners as a whole do report to the responsible authority animals which they so suspect, it will be realised that it requires a skilled veterinary clinician to recognise tuberculosis before it or the other diseases affecting a cow's udder previously mentioned have reached a stage recognisable by a layman.

LACK OF ACTION

Though County Councils are responsible for the health and inspection of the cattle within their administrative areas, it is significant how few counties are fulfilling their obligations in this very important aspect of public work. As far as the writer is personally aware, in only very few counties in England are the herds belonging to persons supplying milk for sale regularly examined by veterinary surgeons.

The law on the subject of milk from a disease-prevention point of view has been severely criticised by many writers, but it has been my experience in many parts of Great Britain that the Milk and Dairies Acts and the Diseases of Animals Acts as they are at present give one a very strong lever and support in controlling animal diseases:—

(*a*) affecting man; and
(*b*) affecting other animals.

What is really required is that instead of a routine examination of dairy herds being optional, it should be made compulsory. Veterinary science has gone forward by leaps and bounds of late years. In my opinion there is an imperative need for educating the public to demand milk which will not be a menace to their good health. An enlightened public would, it seems logical, expect their local authorities to arrange for qualified persons to examine the animals producing the milk they consume. It is well known that throughout the country the waiting list for admission to sanatoria is a long one, and it would be substantially reduced if there were no cases therein due to the bovine bacillus.

In the county which the writer has the honour to serve there has been in practice since January, 1928, a quarterly examination by veterinary officers of every herd belonging to registered cowkeepers. Many cases of bovine tuberculosis have been dealt with which would otherwise have never come to light, no less than 261, or 60·3 per cent., being discovered on the occasion of the routine examination of the milk-producing herds during the period January 1st, 1928, to September 30th, 1930. Further, of 129 animals dealt with as suffering from tuberculosis in a given period, 59 showed tuberculosis of the udder on *post-mortem* examination. Each of those 59 animals was capable, either continuously or intermittently, of infecting through their milk thousands of children, who, if they develop the disease, must later on seek refuge in a sanatorium and be a preventable burden

on the nation. In the year 1929, in addition to animals discovered to be tuberculous, no less than 428 cows-in-milk were found to be suffering from conditions and diseases which would have made selling of their milk an offence against the Milk and Dairies Acts.

The efforts of one county council, however, are nullified if adjoining county councils fail to take reasonable and proper steps to protect their milk supply, having regard to the fact that with present-day transport milk is often consumed many miles away from where it is produced.

To conclude, the value of a routine examination of herds, as it is carried out in Surrey, may be summarised as follows:—

(1) the detection of cows with tuberculous udders;
(2) it is the only practical method of detecting "open" cases of tuberculosis, *i.e.*, cases which can be definitely diagnosed on clinical grounds;
(3) it enables the detection of pathological conditions, other than tuberculosis, in cows from which milk must not be used for human consumption;
(4) it facilitates hygienic advice to stock-owners and other educational work with a view to the prevention of disease.

There is no doubt in my mind that if a routine examination of all milk producing cows were carried out in this country, the amount of diseased milk gaining access to the public would be very much reduced. The expense might be heavy but surely no expense should be spared where human life or human physical impairment is concerned.

I earnestly hope that the Government will see its way to inaugurate a bovine tuberculosis eradication scheme which would be a boon to the farmer and the milk-consuming public alike.

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Captain Burndeed, F.R.C.V.S., Veterinary Officer, Blackburn, opened the discussion in a very able manner, driving home some of the essayist's points. Although the subject matter of this paper had been extensively encroached upon in the talk on the preceding paper, there ensued a good discussion, which was limited only by the time at our disposal.

A county chief sanitary inspector quoted his experience and condemned completely the employment of part-time veterinary inspectors, stressing the need for the appointment of whole-time veterinary staffs in every county.

He was followed by Mr. Gooch, F.R.C.V.S., Stamford, who supported part-time inspectors, overlooking (in your Correspondent's view) the obvious difference in outlook between the elderly, well-established general practitioner and the young commencing man as part-time inspectors.

Professor Share-Jones made some strong remarks on the system of keeping milk cows in town sheds, and Alderman Muirhead, of Liverpool, deplored that the Milk and Dairies Act had robbed large urban districts of the power to inspect cows in other districts supplying milk to such urban districts. Considering the omission of the councils of the counties neighbouring Liverpool to appoint adequate veterinary staffs, his concern is not surprising.

Mr. Jackson Young, F.R.C.V.S., agreed that veterinary inspection of milk-producing animals was of great value and considered that the veterinary inspector should also inspect all utensils used in milk production and act as guide, counsellor and friend to the producers. Enquiries of a general nature should also be made concerning the health of the workers on farms and other premises where cows were kept: it was not advisable for cows to be milked by persons affected with open tuberculosis. He advocated that in clean milk competitions the health of the animals should be taken into consideration and that no award be given unless the certificate of a veterinary surgeon showed that the herd was apparently healthy and the milk was free of pathogenic organisms.

The meeting terminated with a vote of thanks to the President, proposed by Mr. Frood, F.R.C.V.S., of the Ministry of Agriculture.

The second day's meeting was attended by 130 people, including a considerable number of whole-time veterinary officers, some of whom had travelled long distances to attend.

It was very disappointing again to notice the very few veterinary surgeons other than the above. It cannot be too strongly pointed out to the members of our profession that no progress will be made by merely discussing amongst ourselves subjects of professional interest, but that if the profession is to prosper—nay, to live—we must go into other company and let them know that veterinary science has something to offer which is of vital importance to public health and therefore to our national welfare.

SHIRES GORED BY BULL

At Littlebury Green, near Saffron Walden, Essex, a three-year-old Shorthorn bull broke out of a meadow during the night and came into conflict with six Shire horses. One valuable young horse was found dead, and three others were severely gored, one so badly that it is doubtful whether it will recover, the other two being severely cut about the body. It was thought that the horses were asleep, and were charged in turn by the bull. The horse that was killed was so badly damaged by the first charge that it was evidently helpless to defend itself.

The bull, its face covered with blood, was found in some farm buildings, where it had gained access by lifting bodily a heavy yard gate. It showed no signs of injury.

INFECTIOUS ABORTION IN CATTLE*

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Dairy Research Division, Ministry of Agriculture, N. Ireland

It has fallen to my lot to offer a communication regarding infectious abortion in cattle; in fact, this discussion would scarcely be complete if this problem were omitted.

At the outset, one will readily agree that it is impossible to deal with a subject of this magnitude in the limited time allowed. I propose, therefore, to confine my remarks to certain aspects of this question which are directly or indirectly important from a public health view point.

I think one is safe in saying that this disease causes almost as great loss to the agricultural community as tuberculosis. It is of world-wide distribution and is a real and growing menace to all cattle breeders. In reckoning the toll that this disease exacts, it must be looked at from several standpoints: (1) The loss of calves due to the actual abortion; (2) the loss in milk consequent to the abortion; (3) the loss due to sterility, which is often a sequel to abortion, and which may be of a temporary or permanent nature; and (4) the public health aspect.

In Northern Ireland, infectious abortion in cattle is a very common and very serious disease and, while one cannot give figures to show the percentage of cattle infected, we do know that it is widespread in its incidence, and that there are few parts of the province which have escaped its ravages.

Owing to the constant traffic in milking cows, dairy herds are seldom free from this disease and, also for this reason, it is found more commonly around the towns than in the more remote country districts. I can scarcely name a town of any size in Northern Ireland which has not one or more infected herds in its vicinity. During 1928, we had occasion to collect some 200 blood samples from certain districts in Counties Tyrone and Fermanagh. These samples were taken from 46 different farms over a fairly wide area. On being submitted to the agglutination test for evidence of the presence of *Brucella abortus* agglutinins, twenty-five per cent. of them were found to give complete agglutination in dilutions of one in fifty or over. We accept complete agglutination in a dilution of one in fifty as denoting present or past infection with *Brucella abortus*. The percentage of infected cows in the remaining counties is probably not smaller, but, unfortunately, we have no reliable figures from which to draw definite conclusions, as the blood samples which we receive from these counties are from suspected cases of abortion and not taken at random over an area. These samples, of course, indicate to us that infection is widespread.

The cause of infectious abortion was discovered by Bang in 1891 and was shown by him to be a small gram- bacillus to which the name *Brucella abortus* is now given. This organism has been the cause of much research and investigation and particularly so since its relationship to *Br. melitensis* has been recognised. It is the commonest cause of abortion in cattle in Northern Ireland and, while undoubtedly there are occasional cases of abortion due to other causes, we can state definitely that in all outbreaks investigated by the Veterinary Research Division of the Ministry of Agriculture, N.I., and where a sequence of abortions has occurred, this organism has been found to be the causative agent, either by the agglutination test or by direct cultivation from the aborted fœtuses. In this connection it may be mentioned that we have experienced very little trouble in getting primary cultures to grow. The technique which we adopt is as follows: The carcass of a freshly-aborted fœtus is seared along the middle line and opened with sterile instruments; the stomachs are seared, punctured with a sterilised, drawn-out pipette, and some of the stomach contents carefully aspirated and sown on trypsin agar slopes (prepared from Douglas' trypsin broth). The cotton-wool plugs are then flamed and pushed down in the test tubes and these are closed immediately, either with sealing wax or a tightly-fitting rubber cap. Growth is generally visible in about three days, but we have had cases where growth was not discernible for a much longer period. The *p*H of the media should fall between 7·5 and 7·8. The organism can also be cultivated in a similar manner from the spleen of artificially-infected guinea-pigs.

In Northern Ireland, at present, we have no record of any stock other than cattle being infected with *Br. abortus*. Outbreaks of abortion disease have, however, occurred in swine in other countries, notably the United States. We do know that almost all other domestic animals, including the guinea-pig, can be infected artificially. The fact that we have not had our attention drawn to outbreaks of abortion disease in swine in Northern Ireland is significant when one considers the amount of skim milk used for feeding purposes.

Natural infection in cattle occurs chiefly through the mouth, but infection can also be conveyed through the vaginal mucous membrane and Cotton and Schroeder[1] have shown that a drop of infective material can convey infection through the conjunctival mucous membrane.

* Read before the Royal Institute of Public Health, Belfast Congress, May 12th, 1932, as a contribution to the discussion on "Abortus Infection in Ireland."

Infection has also been set up artificially by inoculation through the teat canal, by scarification and by subcutaneous and intravenous inoculation. The period of incubation varies from one to several months.

In the animal body, the natural habitat in the female appears to be (1) the gravid uterus and (2) the udder and related lymph glands. In this connection, it may be mentioned as a matter of interest that we have had several instances of virgin heifers agglutinating *Br. abortus* in serum dilutions of one in two hundred or over. Unfortunately no opportunity presented itself of investigating these cases with a view to discovering what organ or tissue was involved. In the male, the organism occasionally attacks the genital organs, producing abscess-like conditions in the testicles, epididymis and vesiculæ seminales.

The disease in the cow is a specific, catarrhal metritis, the abortion being merely a symptom of the disease. The location of the germ in the udder is more important from a public health point of view, particularly so, since a few cases of undulant fever due to this germ have been confirmed in man, and the natural assumption is that they were occasioned through an infected milk supply.

The point which concerns us most is what percentage of infected cows secrete *Br. abortus* in their milk? Sven Wall (Stockholm)[2] has investigated the milk of sixty cows infected with *Br. abortus*. The milk samples were collected and examined at regular intervals over a period of five months after abortion. Of these sixty cows, fifty-two, or almost 87 per cent., were found to be excreting *Br. abortus* in their milk at some time or other during the period of five months. Actually of all the milk samples examined during this period from these cows, between 51 per cent. and 58 per cent. were found to be infected.

Holth (Oslo)[3] investigated the milk from thirteen cows during a period of about one month after abortion had taken place and found nine of them infected. In a large stock, thirty-five reacting cows were examined and four were found to be excreting *Br. abortus*. In another herd of sixty-five cows, thirty-five were found to be excreting the bacillus. The trade milk in Oslo was also examined and Holth states that on account of the mixing of milk from many farms, few samples were found to be infected. Thus, of one hundred and six samples from shops, only one was found to contain abortion bacilli, whilst two hundred and forty-one samples of mixed milk from farms contained abortion bacilli in forty-four cases, or in almost twenty per cent. of samples. Other workers have obtained somewhat similar results, but length of time prohibits their discussion.

In Northern Ireland, the Animal Diseases research staff have had under observation for some time a large herd of dairy cows affected with abortion.* The first abortion occurred in July, 1930, and was found, by means of the agglutination test, to be due to *Br. abortus*. No further abortions occurred until March, 1931, and to date some thirty abortions have taken place.

In March, 1932, we collected fifty milk samples from individual cows in this herd. Fifteen c.c. of each sample were centrifuged at 3,000 revolutions for twenty minutes, and the cream and sediment thus obtained were inoculated into guinea-pigs. All the guinea-pigs used had been examined for evidence of *Br. abortus* agglutinins with negative results. One month after inoculation they were again bled and examined for evidence of infection with *Br. abortus*. At the same time as the milk samples were collected, blood samples were also taken from each cow and examined for *Br. abortus* agglutinins. This investigation gave the following results: Nineteen cows out of fifty examined were found to be excreting *Br. abortus* in their milk, or a percentage of 38.

A serum agglutination test carried out on these fifty cows showed that eighty-four per cent. of them agglutinated in dilutions of one in fifty, or higher.

Actually, thirty-four cows agglutinated in a dilution of one in two hundred and of these thirty-four, eighteen were excreting *Br. abortus* in their milk.

The remaining cow which was excreting *Br. abortus* in her milk at the time of this examination agglutinated in a one in fifty dilution.

Of the remaining fifteen negative cows, two agglutinated in a one in one hundred dilution, five in a one in fifty dilution and six failed to show agglutination in a one in twenty-five dilution, the greatest concentration of serum used.

The titre in the guinea-pigs' blood in seventeen cases rose to one in one thousand, or over, in one case to one in four hundred, and in one case to one in forty.

Accepting Hedstrom's[4] experiments, this would indicate that the inoculation material contained numerous bacilli in eighteen out of the nineteen positive cases.

Sven Wall's[2] experiments previously referred to show that infected cows do not constantly excrete abortion bacilli in their milk, and it is very probable that had this herd been regularly tested over a period of months, the percentage of animals found excreting *Br. abortus* in their milk would have been much higher.

The herd from which these milk samples were taken has been submitted to the agglutination

* A paper on these observations is in course of preparation by Messrs. Lamont, Kerr and Shanks.

test at regular intervals, with a view to investigating what agglutinating titre should be taken as indicating infection. At the time of the first herd test carried out in January, 1931, fifty-one animals showed no agglutination in a one in twenty-five dilution. Fourteen animals showed agglutination varying from " slight " to " complete " in a dilution of one in twenty-five; one animal showed agglutination in a dilution of one in fifty and three animals showed agglutination in a dilution of one in two hundred. At a herd test carried out in April, 1932, after infection had become widespread in the herd, only three animals were found which failed to agglutinate in at least a one in twenty-five dilution.

Time, unfortunately, does not permit of a detailed examination of the results of these various agglutination tests. Briefly, we noted that the animals which had been completely negative at the first test showed agglutinins in increasing numbers at subsequent tests. We also noted that five animals aborted which only showed agglutination in a titre of one in twenty-five at tests carried out within two months prior to abortion. Three animals failed to agglutinate within two months prior to abortion. After abortion, the agglutination titre in these eight cases quickly increased.

The experience gained in this herd inclines us to the view that in an affected herd agglutination in a one in twenty-five dilution should be considered as denoting exposure to infection with *Br. abortus* and probably positive infection. We are also of the opinion that, if an effort is being made to build up a clean herd on the basis of the agglutination test, the interval between the tests should not exceed one month. A longer interval is inadvisable.

In conclusion, infectious abortion causes such serious economic loss that every effort should be made to stamp it out.

At the moment, there are not sufficient statistics to show that it is of serious importance from a public health viewpoint. When we consider the prevalence of the disease amongst cattle and that over a period of years only a relatively few cases have been recognised in human beings, there does not seem to be much occasion for undue alarm. There are other far more important problems.

In regard to the stamping out of the disease in cattle, I believe that the most important points are: (1) Prevention of the introduction of the disease to clean herds by isolating and blood-testing all new animals; (2) keeping infected herds self-contained and blood-testing bi-annually until the percentage of reactors has fallen sufficiently to make it economically possible to dispose of them to the butcher.

Building up clean herds from infected herds by methods of segregation is not a practical proposition in Northern Ireland. Conditions on farms, generally, are not suitable. In addition, farmers as a rule do not seek professional advice in time, the first abortion being usually attributed to a hurt or some accidental cause and, when assistance is sought, infection is widespread.

Acknowledgments.—I wish to acknowledge, gratefully, the advice and assistance received from my colleagues, Messrs. Kerr and Shanks, in the preparation of this communication.

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[1]Cotton, Dr. W. E. (who cites Dr. E. A. Schröeder). " Infectious Abortion of Cattle, Swine and Sheep in the United States." Eleventh Inter. Vety. Congress, 1930. Vol. II, p. 133.

[2]Wall, Sven, D. V. M. " On the Percentage of *B. abortus* in the Milk of Cows that have aborted in consequence of Infection with *B. abortus* Bang." Eleventh Inter. Vety. Congress, 1930. Vol. II, p. 344.

[3]Holth, Prof. H. " Infectious Abortion in Cattle, Sheep and Swine." Eleventh Inter. Vety. Congress, 1930. Vol. II, p. 151.

[4]Wall, Sven, D. V. M. (citing H. Hedström). As in No. 2 above.

The Veterinary Record

August 20th, 1932.

THE JUBILEE CONGRESS

WHETHER or not the Jubilee Congress of the Association held throughout last week at Folkestone constituted a " record " gathering in point of numbers—and it would appear that an over-all attendance of approximately 300 justifies the claim—there can be no doubt that for sheer enjoyment it has never been surpassed. With beneficent timeliness a heat wave worthy of the name arrived at the scene of our convention, as elsewhere, at the precise moment which witnessed its opening by the President. From that instant success was assured, quite irrespective of the attractions of the admirable programme provided by the Provisional Committee, for as a pleasure resort Folkestone possesses outdoor attractions, both natural and artificial, which surely are second to none.

The Conference received a magnificent send-off at the opening meeting on Monday morning, supplemented by the President's evening Reception, and it is a tribute to the personal popularity of Colonel Simpson and his lady that one " record " at least was created in the attendance at the latter supremely delightful function. Needless to say, the Mayor of Folkestone, Alderman J. W. Stainer, honoured both

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by his presence—needless, because His Worship laid Congress under no inconsiderable debt and at the same time set a splendid example to the First Citizens of future Congress centres by a gratifyingly close association with the proceedings throughout.

As our members are already aware, this year's Congress achieved an unprecedented degree of dignity and importance by reason of the presence of an exceptional number of delegates from Government Departments and Local Authorities, while of at least equal significance from the point of view of prestige—both of the Association and the profession—was the presence for the first time of a delegate from the Ministry of Health, in Sir Welldon Dalrymple Champneys, which, as the President pointed out in his address, was happily indicative of closer contact between the veterinary and medical professions. Further gratifying evidence of the Association's extended and extending sphere of influence was afforded by the messages of goodwill received from various Continental Veterinary Associations, and by the presence of Dr. L. Tobback as delegate from the Veterinary Union of Belgium.

On the Wednesday, Congress attained high-water mark in point of numbers and interest. Then it was that, at the Annual General Meeting, members took the President—but certainly no-one else conversant with his heroic labours on behalf of the N.V.M.A.—by surprise in electing him to that office for the third time in succession. This honour is unique in the history of the Association, if we except the period of the War, and any hesitation as to acceptance that Colonel Simpson very naturally may have experienced as the result of an inevitable weariness, born of the crescendo of Presidential activity preceding and accompanying Congress, was happily overborne by his enthusiasm for the "National" and by the immense reception accorded to the resolution.

The Address from the Chair was an exceedingly effective pronouncement in which a nice balance was preserved between those points exclusively of interest to members and those, particularly in regard to unqualified practice, of supreme if unrecognised moment to the general public.

Papers presented to Congress have been in the hands of members for some considerable time and their high quality is therefore common knowledge. They and the discussions upon them will shortly be published in this journal—the first two in our Special Congress Number, which it is hoped to issue on September 3rd. Suffice it now to say, therefore, that in the majority of instances these discussions were worthy of their source, though it was a matter for regret that in more than one instance curtailment was necessitated by the juxtaposition of two papers of exceptional general interest. A whole morning is clearly none too long for the consideration of the majority of papers presented to a modern veterinary Congress.

Attendances left little to be desired, despite the seductive sunshine and the claims of links and sea, for at every session the commodious Town Hall presented a well-filled appearance. It is a matter of real regret to us that the same cannot be said in regard to the periods during which the Exhibition Hall was open. Quite definitely the very sincere appreciation voiced by the President of the successful efforts to stage an effective display put forward by our friends who cater for the medicinal and surgical needs of the profession should merely be supplementary to the general expression of that sentiment which a satisfactory attendance denotes. We should have deemed it obvious that the concentration under one roof of the products and appliances of the leading firms of veterinary druggists and instrument makers constitutes an opportunity for extended examination that no practitioner can afford to miss. The position was somewhat mitigated by an appropriately increased degree of visitation on the day devoted to operations, which, of course, was an occasion of outstanding interest to the clinician. For once there was no ground of complaint of inability to see what was going on at the operating table, a room adjacent to the Woodward Hall being most effectively transformed into an operating theatre with such seating accommodation as could afford no reason for wrath to the onlooker afflicted with lack of inches. The operations themselves were suitably selected and skilfully performed, and with the tuberculin test, X-ray and other demonstrations, provided a most adequate practical side to the proceedings. Such features as the Popular Lecture, a memorably enjoyable Annual Banquet, light of speech and gay with song, and a Grand Ball for the profession's own charity rounded off a festive week which none privileged to participate in it will fail to remember with feelings of gratitude to Major Dalling, the Local Secretary, and all associated with him in the great task of preparation and its wonderful fulfilment.

Clinical Communications

HERNIA OF THE FLANK IN A DONKEY

D. MOSSINSON, M.R.C.V.S.
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Subject.—Native donkey, eight years old.

History and Diagnosis.—The donkey had been admitted to the hospital on account of lameness. While approaching the donkey, my attention was immediately drawn to a swelling, the size of a child's head, on the left flank. To the touch it was a soft fluctuating swelling, and my first impression was that I had before me a hæmatoma. On further examination I pressed on the swelling and found my hand passing into the abdominal cavity through a well-defined opening in the muscles—an opening measuring 10 c.m. by 7 c.m. —thus my closed fist could easily be introduced. Being faced with a hernia, I gripped the skin to find whether there were any adhesions. This seemed to cause pain and the donkey resisted manipulation. With further careful and patient palpation, I found the protruding contents to be adherent to the hernial sac. By pressure, the whole hernia could easily be made to disappear, but it re-appeared immediately the pressure was released. Speaking to the owner, I found out that the hernia had shown itself while the donkey was very young—but had caused no disturbance and the donkey had regularly been worked all those years.

Since I believed this to be an unusual case, I decided to record it.

The accompanying photograph is unfortunately not too clear, but on careful observation the swelling can be observed.

There are ten English breeds of sheep in general use on the farms of Australia—Lincolns, Leicesters, Border Leicesters, Romney Marsh, Southdowns, Shropshires, Suffolks, Dorset Horns, Ryelands, and Hampshire Down. Of these breeds there are 1,055 registered flocks.

CAPONIZING*

S. JAMIESON
Glasgow Veterinary College

The subjects were six roosters varying from three to five months. It was decided to caponize three by the American method and three by the Continental method.

The American Method.

Technique.—The cockerel was restrained by attaching a ½-lb. weight around the wings by a piece of strong twine about two feet long and similarly around both legs. The bird was first placed upon its right side.

The feathers were removed over the last two ribs and the skin sterilised with methyl ether. An incision was now made between the last two ribs. The incision was about three-quarters of an inch long and extended through the skin and musculature. The spring retractor was now inserted and the lips of the wound held apart. The peritoneum was now lifted with a pair of fine forceps and incised. The testicle was now seen as a yellow body not unlike the colour of a "chicken-fat" blood clot and oval in shape. The spoon was now introduced into the cavity and the testicle grasped in its jaws. A few turns and a steady tension and the testicle was free and withdrawn. The wound was closed with a silk suture through skin and muscle and brushed over with collodion. The bird was then turned on its left side and the other testicle removed.

The Continental Method.

Technique.—The bird was held this time with its back downward and its hind-quarters towards the operator. The skin was again plucked and sterilised and an incision was made midway between the posterior extremity of the sternum and the anus. The incision was again made through the skin and underlying musculature. It was about three-quarters of an inch long. The peritoneum was incised and the index finger introduced into the wound and directed towards the anterior end of kidney. When the testicle was located and recognised it was enucleated all round its circumference with the end of the finger and separated from its attachments and left to float free with the other viscera. The other testicle was enucleated in the same manner without withdrawal of the index finger. The wound was then sutured.

Comments.—In caponizing a salient feature in promoting the success of the operation is the starving of the birds for two days prior to operation. A small electric torch is, in my view, a useful acquisition in the American method as good light is an essential to the operation. I

* Case in series presented for award under the N.V.M.A. Clinical Prize Scheme for Students, 1931.

also believe that if the testicle spoon contained a cupped flange instead of the flat flange generally seen, traumatic lacerations of the surrounding organs would be less common. According to our results the Continental method would seem to be the better, as one of the birds operated by the American method succumbed with peritonitis. The birds were all fed on soft food afterwards and the perches removed to prevent flying.

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SEALED TEATS IN A EWE*

W. A. MILLIGAN
Glasgow Veterinary College

Subject.—A Cheviot gimmer.

History.—The ewe had given birth to a single lamb on the previous day. The latter was observed that morning to be bleating piteously, making frequent efforts at obtaining nourishment without appearing to derive much satisfaction therefrom.

The herdsman examined the ewe and found that on manipulation no milk issued from either gland.

Clinical Appearance.—On examination the two teats were found to be almost identical. Both were very much smaller and not so flaccid as in the normal. A careful digital examination of the extremities failed to reveal any fibrous thickening.

Four very minute, light greyish points were observed at the apex of each teat, but there was no evidence of a wound. The two glands were distended and quite firm (not hard) to the touch. No milk could be expressed from either gland.

Treatment.—Tangled masses of wool which were in contact or likely to come into contact with the teats were cut off. The two teats and adjacent parts of the mammary glands were then thoroughly cleaned with iodo-benzol and later the apices of the teats painted with tinct. iodi.

One of the teats was grasped firmly between the fore-finger and thumb of the left hand and a sharp knife was drawn carefully across the middle of the apex. The incision was carried through the skin a short distance and then another incision was made at right angles to the first. Each incision was lengthened until milk issued from the wound on pressure. A bistoury caché was then carefully inserted and the hole enlarged until a sufficiently free flow of milk was obtained, this being more than from a normal gland, allowance being made for a diminution of flow on cicatricial contraction taking place. At first there was a tendency for the milk to be ejected at a tangent, but this was rectified on the wound being enlarged in the right direction.

The procedure was repeated on the other teat.

Bleeding was very slight and soon stopped.

The lamb was then allowed to go to the ewe and started to suck almost immediately.

Instructions were left that any scab forming and occluding the orifice was to be carefully removed.

A tube of white vaseline with eucalyptus oil 5 per cent. was left with instructions to rub in just a trace to soften the scab.

No undesirable sequelæ were reported.

* Cases in series presented for award under the N.V.M.A. Clinical Prize Scheme for Students, 1931.

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RUPTURE OF THE DIAPHRAGM IN A DOG*

W. A. MILLIGAN
Glasgow Veterinary College

Subject. — A pedigree, wire-haired, fox terrier dog. Age, nine months.

History.—The dog was returning from a walk with its owner, during which time it had been, as usual, very active, greeting all its canine acquaintances with friendly barks.

Shortly before reaching home the dog was missed and later found seated at the front door in an exhausted condition and evidently far from well. A messenger-boy reported having seen him squeezing through the railing of a near-by garden, but otherwise his movements during the short time he was out of his owner's sight were unknown.

Professional advice was immediately sought.

Symptoms.—The general appearance was one of dulness, the patient crouching somewhat awkwardly on the floor and showing a great disinclination to move. When lifted to its feet it stood with back arched, a condition which became even more marked when forced to move a few steps. There was considerable respiratory embarrassment. Thoracic movements were markedly exaggerated, the inspiratory effort being in the nature of a gasp. The abdominal movements were more or less in abeyance, the muscles being kept firmly contracted. Respirations, 36 per minute.

Auscultation revealed an area of dulness over the posterior part of the left side. Pain was evinced on palpation of the abdomen, but no evidence of an external injury could be found. Temperature: 101·2° F. The visible mucous membranes were normal, and the pulse was good.

Diagnosis.—The condition was diagnosed as that of an internal injury from an unknown cause, a very guarded prognosis being given.

Treatment.—The patient received a hypodermic injection of 3 c.c. camphor in oil and instructions were left that he be kept warm

and undisturbed. When seen some hours later the conditions showed little change. A similar injection of camphor in oil was administered and instructions given that the patient could receive a little warm milk if so inclined.

The dog was removed to hospital the following morning for the purpose of making an exploratory laparotomy, obstruction from a foreign body being suspected.

Preparatory to chloroform anæsthesia a hypodermic injection of 1 gr. morphine sulphate was given.

A little later, when brought to the operating table, the patient was seen to be in a state of collapse. The visible membranes were exceedingly pale and the pulse imperceptible. Respiration was made in gasps. The animal very soon expired.

Post-mortem Examination.—There was evidence of peritonitis on opening the abdominal cavity. The omentum did not extend as far back as usual and on being reflected no sign of the stomach could be found, though the spleen was visible, and only about two-thirds of the liver.

Digital exploration revealed the presence of free communication between the thoracic and abdominal cavities in the region of the tendinous centre of the diaphragm.

The sternum and a portion of the ribs on each side were removed and the diaphragm was carefully freed from its costal and sternal attachments. The thoracic contents were now demonstrable.

The stomach was seen completely to fill the left pleural cavity, the heart being pushed entirely to the right of the median plane. Further examination revealed that the saccus cæcus was situated dorsally and in contact with the pleura, diaphragm and left costal wall, the greater curvature ventrally forward and to the left. The stomach contents appeared to be half fluid and half gaseous.

Examination of the diaphragm revealed the hiatus œsophagus to be intact, but from a point just ventral to the hiatus to the border of the muscular portion the rupture was found. The muscular portion was only affected in very slight degree, the tendinous centre being almost solely involved.

By manipulation it was found possible to return the stomach through the rupture into the abdominal cavity, and in so doing it was seen that the œsophagus was folded ventrally on itself to the complete occlusion of its lumen. The stomach was then removed and on measurement was found to have a capacity of 17½ fluid ounces. There was no evidence of gastritis; enteritis was present in small localised areas.

The lungs were congested and of spleen-like consistency, the diaphragmatic lobes on both sides being most affected.

Review*

DENTITION OF THE PIG

The account of the investigations in respect of the dentition of the pig, which have been carried out by Principal O. Charnock Bradley, M.D., D.SC., M.R.C.V.S., Royal (Dick) Veterinary College, Edinburgh, was published in the "Transactions" of the Highland Agricultural Society of Scotland in 1930. That report has now been extended by a second report which appeared in the "Transactions" of the Highland Agricultural Society of Scotland for 1932, and has now been reprinted and issued as a separate pamphlet.

From this pamphlet we see that Dr. Bradley has carried on his investigations on 670 specimens. Apparently these investigations were carried out on *post-mortem* specimens, as he mentions at the end of the report that the specimens were furnished by Mr. R. E. Dorrell, of Epsom. One would hesitate to suggest that the specimens were other than authentic as regards age, but one may mention that it has been found in practice by many investigators that the statements of farm hands and workers in connection with the age of animals, though sincere, are often unreliable, particularly as regards the date of birth, and unless some special system of marking or identification is carried out, or some method to ensure 100 per cent. reliability, it can hardly be considered to be in accordance with the usual methods of arriving at conclusions in scientific investigations.

Mention is made in the report, in several instances, of the investigations which have been carried out by Messrs. DeVine and Dawes, and it may be interesting to note here that in their investigations, after some early trials they concluded that it would not be safe to rely absolutely upon information as to the date of birth given in respect of pigs at farms and slaughterhouses, and they therefore took the precaution, in regard to the pigs' jaws coming under investigation, of marking the pigs by tattooing them on the ear at the time of birth and examining them not on *post-mortem* but during life at various ages.

It is stated in the pamphlet by Dr. Bradley that the notes are solely concerned with the permanent teeth that normally erupt before the animal has reached the age of one year, no notice being taken of the state of dentition at more advanced ages. The report deals with the following teeth:—

(1) The first true molar, that is, the first

** IT HAS BEEN DECIDED THAT ALL BOOK REVIEWS PUBLISHED IN THE "VETERINARY RECORD" SHALL BE INSERTED WITHOUT THE NAME OR INITIALS OF THE REVIEWER.*

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"molar" that has no representative in the milk dentition; (2) the first premolar; (3) the third or corner incisor; (4) the canine or tusk; and (5) the second true molar.

(1) The First True Molar.

The first true molar, it is stated, was found in the youngest specimen at 15·5/7 weeks and the oldest, in which the tooth was in process of eruption, was 26·3/7 weeks. Therefore it seems probable that, roughly speaking, the lower tooth may be cut at any time from approximately three-and-a-half months until just over six months. From this we see that Dr. Bradley, like other workers, is unable to determine any definite period at which this tooth is cut. This is in accordance with the conditions found by Messrs. DeVine and Dawes who, as Dr. Bradley observes: "have repeatedly found the fourth molar through the gum in pigs between the ages of five and six months," but they are unable to state any definite period for its eruption. It would appear, therefore, that authorities at the present time agree that the eruption of this tooth is not to be relied upon for the indication of the age of a pig. On the other hand, taking into conjunction with the state of eruption of the corner incisor the fact that the fourth molar is erupted, it is certainly helpful in determining that the pig is over six months old.

(2) The First Premolar (The First Molar).

Dr. Bradley mentions that the lower first premolar is very obviously completely worthless as an indicator of age. Messrs. DeVine and Dawes found that this tooth was so varied in its time of eruption that it is not referred to as a tooth to be relied upon as an indicator of age.

(3) The Corner Incisor.

In Dr. Bradley's pamphlet it is stated that the third or corner incisor has been the special object of examination in 276 specimens. He further states that the youngest specimen in which the permanent corner incisor was present was 27·1/7 weeks old. In this he apparently agrees and adds further proof to the conclusion drawn by Messrs. DeVine and Dawes who stated that, in their opinion, the corner incisor is not cut until the pig is six months old and they were so convinced of the age at which this tooth is erupted and the reliability to be placed upon it as an indication of age, that they advised, in their report to the National Pig Breeders' Association, the classing of an animal as exceeding six months of age which had one corner incisor cut. In Dr. Bradley's own words, he states: "It seems fairly safe, therefore, to conclude that very few, if any, pigs of exactly six months (26 weeks) have begun to cut the corner incisors."

Although Dr. Bradley's conclusions agree with those of Messrs. DeVine and Dawes as regards the cutting of the corner incisors, he further states on page 10: "On mature consideration this amendment will probably not be regarded as so satisfactory as it appears at first glance, for it obviously affords no guide to the estimation of possible excess over six months."

It is to be remembered here that the question of an animal being six months or over is one of great importance to the Pig Breeding Associations and to the Agricultural Shows where animals are examined specifically for this age. The fact that an animal is six-and-a-half months or seven-and-a-half months is not of any importance from this point of view, and Messrs. DeVine and Dawes set themselves out to get a scientific standard for the age of six months, with which they are particularly concerned.

(4) The Canine or Tusk.

As regards the canine or tusk, Dr. Bradley agrees with other workers that this tooth is not to be relied upon as a fair indicator of the age of the animal.

(5) The Second True Molar.

Refers to the period of eruption of the second true molar or fifth molar. Dr. Bradley states the following: "Nevertheless it seems reasonable to assume that if the tooth has not appeared the pig is not more than one year old; but, on the other hand, if the tooth is present the animal is at least nine months of age." According to Messrs. DeVine and Dawes, *full* eruption of the fifth molar, accompanied by the presence of any of the first three molars, can be regarded as definite evidence of the animal being over twelve months of age.

It would appear from Dr. Bradley's conclusions in respect of these teeth, that he confirms, for all practical purposes, the conclusions which have been drawn by Messrs. DeVine and Dawes, although in reading the report at first glance, without making absolute comparisons with the reports of the different workers, it would appear that different conclusions have been drawn.

Dr. Bradley's summary is as follows:—

"The periods of eruption of the five lower teeth that normally appear before the age of 12 months have been found to be as follows:—

First true molar.—From 15·5/7 to 26·3/7 weeks—nearly 11 weeks.

First premolar.—From 16 to 42 weeks, and frequently the tooth is absent altogether. Its eruption is, therefore, held to be of no value as an indication of age.

Third or corner incisor.—From 27·1/7 to 40·4/7 weeks—over 13 weeks.

Canine or tusk.—From 34 to 52 weeks (probably more)—at least 18 weeks.

Second true molar.—From 40·3/7 to 49

weeks—eight-and-a-half weeks; but there is the possibility that more material may extend the period beyond the 49th week."

Following this there is a further statement:—

"The periods of eruption as given above seem to be of such length as to rule out dentition as a really accurate and satisfactory guide to the age of the pig. It is doubtful if the breeder and exhibitor will be satisfied to know that, while a pig that is cutting its first molar can be only a day or two older than six months, it may be not a great deal older than half this age. Or that, though an animal in which the corner incisor is being cut is not likely to be older than nine-and-a-half months, it may possibly be as much as three months younger.

"The canine or tusk cannot be relied upon to give information of value, and the period of eruption of the second molar is such as to leave room for much the same kind of doubt as that connected with the first molar, though admittedly in a somewhat less degree."

Dr. Bradley's statement, if taken absolutely literally, is rather inclined to leave one in a very nebulous condition as regards the value of dentition as an indication of age, but taking the whole report and examining it in detail, Dr. Bradley agrees that an animal with its corner incisors cut is 27·1/7 weeks old: therefore it is six months—which is very definite as regards six months of age. He also states that it seems reasonable to assume that if the second true molar (fifth molar) has not appeared the pig is not more than one year old. Therefore, one must conclude that if this tooth has appeared the pig is at least one year old. That also forms a definite peg on which one can state if the animal is 12 months old or not.

(The first three molars, which are preceded by milk teeth, are designated by Dr. Bradley as "premolars." The others which are not preceded by milk teeth are named "molars." In the reports of Messrs. DeVine and Dawes, premolars and molars are all known as "molars," no special designation being made for the first three other than milk or molars.)

Dr. Bradley is to be congratulated on bringing forward his investigations on the dentition of the pig and it is to be hoped that other veterinary workers interested in the dentition of farm animals will find this a stimulant for them to publish any scientific investigations which they have made or will make in this connection.

The use of 5 to 10 c.c. of pyrethin in oil was found to be of considerable value in the control of bovine verminous bronchitis, according to Ricaud and Camus. The pyrethin oil mixture was injected intratracheally and produced no unfavourable results. In cases in which the disease was advanced it may be necessary to repeat the injection. (*Exp. Sta. Rec.* Vol. 66, No. 5.)

Abstracts

[**Actinomycosis and Actinobacillosis** M'Fadyean, Sir J. *Jour. Comp. Path. and Ther.* Vol. xlv. No. 2. June 30th, 1932. Pp. 93-105. Fig. 1. Refs. 13.]

This opening contribution to the current "Comparative" is a concise presentation of data from which the conclusion is drawn that actinomycosis and actinobacillosis are ætiologically distinct diseases and should no longer be united under a common name. As an historical review of the researches which have determined this position, the article is of outstanding interest, while the differential clinical features revealed—which are by no means unrelated to success in treatment—are of great importance to the practitioner. Indeed, any who may yet preserve an attitude of indifference to the dual nature of the affection of the hard and soft structures of the bovine head commonly and comprehensively termed "actinomycosis," are summarily deprived of their defences and, it may be hoped, of their contentment, for (to quote the author) "to associate under the same name diseases that are fundamentally different and similar only in non-essential characters, can only serve to hinder progress in clinical diagnosis." Such progress may well reveal that even in the gross appearance of the lesions actinomycosis and actinobacillosis are distinguishable clinically, "but any such differences are not likely to be discovered if veterinary surgeons are encouraged to be content with recognising that any given case is either one or the other." Identification of the organisms is at present essential for accurate diagnosis, except perhaps when the affected part is the tongue, since it appears probable that there are few or no cases of actinomycosis in that organ.

Use of the term "actinomycosis" should be restricted to the disease caused by the *Actinomycosis bovis*, which was first cultivated by Woolf and Israel. It includes practically all the cases hitherto so named in man and a minority of the cases in cattle in which the bones of the head are affected.

Actinobacillosis is the disease caused by the *Actinobacillus lignieresi*, which was first cultivated and accurately described by Lignières and Spitz. In cattle it apparently includes all cases of the so-called "wooden-tongue" in all parts of the world, and an uncertain proportion of cases involving other parts of the body, including the bones of the head.

The question whether actinomycosis and actinobacillosis are equally amenable to treatment with potassium iodide is discussed. Ample evidence in favour of iodine of potassium in the treatment of the lingual disease has been furnished from all parts of the world, but the

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treatment has been much less successful in human disease, and a possible explanation is that the drug is ineffectual against the actinomyces of Woolf and Israel, which is responsible for the disease in man. That, however, would not explain a general failure of the treatment of the disease affecting the bones of the head of cattle, since it is now known that both actinomycosis and actinobacillosis occur in that position, and it is possible that it is the nature of the tissue that affects the result, for practically all bacterial infections tend to be less amenable to treatment where they involve osseous tissue. The matter deserves further consideration and when the iodide of potassium treatment is tried in cases affecting the jaws, it should be determined in advance whether the disease is actinomycosis or actinobacillosis. Such morphological diffentiation, with particular regard to the intriguing story of the acquisition of knowledge concerning it, is the subject of extended reference. W. B.

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[**Bovine Mastitis in Livonia.** Rolle. *D.T.W.* No. 17. April 23rd, 1932. 257.]

The author has systematically examined two hundred cases of disease of the mammary gland in cows and makes the following classification :—

I. Coli-mastitis	34%	of cases.
II. Streptococcic mastitis	50%	,,
III. Micrococcic mastitis ...	11%	,,
IV. Pyogenic mastitis ...	5%	,,

Only that type of mastitis which is caused by *B. coli* is dealt with in this article, and reference is made to the early experimental work of Kitt, Guillebeau, and Hess. The clinical symptoms of Coli-mastitis are as follows. Four hours after infection the gland becomes tightly stretched, hard, swollen, and painful, and the body temperature is raised. Instead of milk the quarter contains a few centimetres of yellowish, watery, cloudy fluid containing flocculi. Generally speaking, the course of this type of mastitis is acute and complete recovery occurs in from 10-30 days, although sometimes the gland may permanently be impaired. In the author's experience from 5 per cent. to 10 per cent. of all Coli-mastitis cases end fatally. This micro-organism has been recognised as a cause of mastitis for a long time, but an endeavour was made to ascertain what specific biological action, if any, *B. coli* exerts on the mammary gland, since this knowledge is important for prognosis and treatment.

Ten cases of acute Coli-mastitis have been completely examined and the following picture is typical. A cow in full milk became ill suddenly. Temperature 105° F., pulse 100 per minute, accompanied by inappetance and atony of the rumen. One quarter of the mammary gland was swollen and painful and contained a little clear, yellowish, watery milk containing white flocculi. The fat content was 0·3 per cent. and the reaction of the fluid alkaline. The sediment chiefly consisted of shed epithelial cells, and numerous micro-organisms subsequently identified as *B. coli*. The animal died on the third day.

The diseased quarter was greatly enlarged, and exceeded twice the normal weight. On section there was a gelatinous infiltration, and the tissue was a dirty greyish-red colour, except near the excretory duct where inflammation was marked. Microscopically, the blood vessels in the septi were engorged and the alveoli were plugged with cells and exudate. Cell degeneration was marked in the neighbourhood of the excretory duct. The process was noted to be less intense as one passed to the deeper parts of the gland.

In Coli-mastitis the inflammatory process is most marked in the gland alveoli, and in acute cases especially there is a striking absence of leucocytes, which is a characteristic of the sediment. With streptococcic mastitis, on the contrary, the inflammatory process is marked in the interstitial tissue; moreover, the damage is more lobular and leucocytes are plentiful.

Regarding pathogenesis, the evidence obtained strengthens the view that infection enters *via* the teat canal, and treatment by mammary infusion with chinosol and rivanol solutions has been tried. Experiments have shown that chinosol is the more satisfactory and is used in large amounts per teat canal, in a dilution of 1 : 1,000. The quarter should not be milked out for at least 12 hours after the infusion. Furthermore, the author recommends salve treatment for the mammary gland. This acts as a compress. Prognosis should be guarded and becomes grave if there is no improvement in three to five days. W. L. S.

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[**Peroneal Tenectomy for Stringhalt.** Ellis, H. R. *U.S. Army Vet. Bull.* 1932. No. 3.]

The author reports 25 cases of complete cure of stringhalt in horses by the operation of peroneal tenectomy, in which the terminal few inches of the tendon of *M. peroneus lateralis* are removed under general anæsthesia and with aseptic technique. The lower severance of the tendon (just above its insertion) is made by a stab stroke and the upper severance necessitates a small longitudinal skin incision.

According to Sir Malcolm Watson, Director of Tropical Hygiene, Ross Institute, the great plateau of Africa, even in the tropics, is nothing like so unhealthy as the belts of tropical Africa, Asia and America at sea level. It is fit for white men to make their homes in and breed a healthy race. Largely, this is a matter of controlling malaria, the great disabling and killing disease in the tropics, and in Sir Malcolm Watson's view, the control of malaria is the only solid foundation on which other preventive measures can be built.

N.V.M.A. Divisional Report

LINCOLNSHIRE AND DISTRICT DIVISION*

Summer Meeting at Peterborough

PROFESSOR G. H. WOOLDRIDGE OPENS DISCUSSION ON CONTAGIOUS ABORTION

The Summer Meeting of this Division was held at the Angel Hotel, Peterborough, on Thursday, June 16th, 1932, the President, Mr. A. J. Hines, occupying the chair. There were also present Messrs. Hudson, Poles, Bindloss, Knowles, F. L. Gooch, F. W. L. Gooch, Lockwood, Porter-Smith, Eaton, Cartwright, Dickinson, Truman, and H. C. Reeks, Junr. (Hon. Secretary). Professor Wooldridge, of the Royal Veterinary College, and Mr. Matthews (President of the Eastern Counties Division) were present as visitors.

The minutes of the previous meeting, which had received publication in the *Record,* were taken as read and confirmed.

Apologies for absence were received from Messrs. Standley, Townsend, and Watchorn.

Royal Sanitary Institute Congress.—Before the business of the afternoon opened the Secretary reminded members that at their last meeting it was decided that Mr. Gooch, Senr., should be invited to represent the Division at the forthcoming Royal Sanitary Institute Congress. Mr. Gooch had done this for the Division on many occasions, and as this was possibly the last Congress that Mr. Gooch would attend, he, the Secretary, would like to propose that he should receive the thanks of the Division and the sum of two guineas as some contribution to his expenses. This was seconded by the President and carried unanimously.

Mr. Gooch, in thanking the members, said that he should be pleased to represent them, and, as in past years, emphasised the importance of the profession being represented at such congresses.

President's Remarks.—In opening the meeting the President said that he offered them his very sincere thanks for the honour they had done him in electing him as their President. He realised that he lacked many of the qualities essential to the perfect fulfilment of the office, but assured them that, as far as his capabilities allowed, he would endeavour to maintain the high traditions of the office.

He asked for their support during his year of office by a more regular attendance at the meetings. The Association was an old-established one, but its meetings had never been particularly well attended. The reason for that, in his opinion, was geographical, and he wondered if they had the best arrangement for the places of meeting. He thought that it would be worth while to try a meeting in the centre of the county, say at Woodhall Spa: he mentioned Woodhall because of its central position and because a meeting there could be made quite a social event. He threw this out as a suggestion and would be pleased to have the opinion of the members.

The President then went on to say that he thought that it was usual for one in his position, at the beginning of his year of office, to say something of the prospects and attainments of the profession. He would not detain them long over that. The present state of affairs was not at all good. With income tax at five shillings in the pound, and agriculture, on which they all depended, at its lowest ebb in modern times, it was inevitable that the veterinary profession, which at its best offered few plums, should share in the depression. The only consolation, if consolation it was, was that they were no worse off than the majority of professions or trades in the country, and that the only course for them was to aim at giving better service to their clients and rendering themselves more indispensable so that they might participate in any general improvement when it did come along.

As to the future prospects of the profession, he believed that, given an improvement in trade and agriculture, the prospects were quite good. They were about to have a five years' course at college instead of four, and this should lead to an increased standard of veterinary education in the profession, while the rebuilding of the college should give increased facilities in practical education, a side that had been sadly neglected in the past. He thought that for general practice there would always be a limited demand, but that the public health side did offer increasing prospects of usefulness for the veterinary profession.

He now came to the business of the afternoon and said what great pleasure it gave him to offer, on their behalf, a very cordial and sincere welcome to Professor Wooldridge, who, at great inconvenience to himself, had come to speak to them on the subject of contagious abortion. The pleasure was the greater because of his early associations with Professor Wooldridge. Not only were they fellow townsmen, but they had been at the same school, went to college together and shared the same rooms there. Since then their paths had diverged, but to him it had always been a source of pleasure and pride that one with whom he had such intimate early associations should have attained so eminent a place in the profession. He had great pleasure in asking Professor Wooldridge to open a discussion on the subject of contagious abortion.

Contagious Abortion: Address by Professor Wooldridge

Professor Wooldridge, after thanking the President and members for the very hearty welcome that they had given him, said that in the first

* Received for publication July 26th.

place they must not expect anything in the nature of a paper from him. His purpose was merely to provoke a discussion by means of a very few remarks on the subject of contagious abortion.

With regard to infection, in the old days it used to be thought that the sole channel of infection was *per vaginam*, either by the flicking of an adjoining infected cow's tail, or by direct contact with discharges, or by actual transference by the bull. Though these channels might still be to blame, it was now generally accepted that the ingestion of food or water contaminated by infective material from an affected cow was by far the most common method of infection.

In the matter of diagnosis, in the first place they made this by the symptoms exhibited at the time of abortion; generally speaking, from the membranes themselves and the nature of the discharge, which was usually of a yellowish colour in cattle and sheep and not offensive unless decomposition had set in. In the case of the mare there was said to be sour odour, but he had not appreciated it—perhaps his sense of smell was at fault. The fœtal membranes of a cow that had aborted were quite characteristic. They were somewhat gelatinous and easily torn, while many of the cotyledons had a yellowish macerated appearance instead of their natural pink colour. Then microscopic examination of a film from one of the affected cotyledons, stained with methylene blue, would show the organisms in characteristic clumps. If such an examination were positive there was no need to proceed to further tests. Failing that, the agglutination test might be accepted as specific. Difficulties might arise in instances where there was a margin of suspicion, but in the attempt to eradicate any contagious disease every doubtful reaction should be regarded as a positive one, and no cow should ever be given the benefit of the doubt.

What should be done with a herd of cows amongst whom the disease was known to exist? This was where they should definitely decide whether vaccines should be used or not. By vaccines he meant the use of live cultures as against dead. The use of the live culture was not free from danger. If animals were inoculated, then two months and not less were necessary for immunity to be established; after that time it should be safe to send the vaccinated cow to the bull. Personally, he preferred three months instead of two before doing so. He usually recommended not less than six months for a field in which there had been infected cows. He did not think that hay made from such a field was likely to be infective, although they knew that where a trouble was parasitic in origin infection might occur by that means. He did not think that hay would be liable to such a danger in abortion, but if there was any doubt it could still be used for horses.

There were two dangers associated with the use of live vaccines. The first was that for a period of time the vaccinated animal was eliminating abortion bacilli and so continually infecting the pastures. The second danger, certainly a less one, was the possibility of setting up a carrier. If the use of live vaccines was resorted to, it had to be carried out every year with the incoming young stock, and although it was a very effective method of control, it afforded no hope of eradication.

Proceeding, Professor Wooldridge said that there was no danger from dead vaccines, and if they had only a few animals that had aborted there was no objection to attempting to fortify those which had not developed the disease. The immunity produced by this vaccine was of short duration and the procedure had to be repeated. This referred to the usual dead vaccines killed by heat. On the other hand, hopes had been expressed that cultures killed by formalin might occupy an intermediate stage between the live vaccine and the old dead vaccine. It was suggested that the antigen that was destroyed by heat might not be destroyed by the formalin, in which case a stronger and more durable immunity might be established than by the old dead vaccine and without the objections attached to the use of live vaccines. But much more work needed to be done to establish those points and if it should prove to be correct it would be a perfect godsend to the dairy farmer.

The procedure he recommended in all except very extensive infections was the strictest isolation or segregation, and disinfection.

They had not been in the habit of paying enough individual attention to the cow that had aborted. She might not be very ill and as a result some farmers were apt not to bother with her. The uterus should be irrigated as long as there was any discharge. There were a number of materials from which they could take their choice, such as half per cent. lysol or 2 per cent. carbolic acid. Another, recommended by the late Professor Nocard, which was very effective and which did no harm, consisted of perchloride of mercury 2½ drams, glycerine 5 ozs., alcohol 13 ozs., water 35 pints. In the case of some particularly valuable animals, however, people liked to resort to more expensive agents, but he did not think that they were any better than the perchloride solution.

The whole herd should be tested by the agglutination test and reactors separated from non-reactors. The test should be applied three times a year, and no cow should be returned to the clean herd until she had given two negative reactions to the test. He knew of no remedies administered by the mouth that were of the slightest use, and he was of the opinion that the various proprietary remedies sold for that purpose were absolutely valueless.

As to whether the use of vaccine for abortion caused sterility, there were divergent views. He was of the opinion that it did not, while on the

other hand, there were numerous reports to the opposite effect, namely, that in herds where sterility had been rife vaccination with *Brucella abortus* had completely altered the position.

The President, in opening the general discussion, thanked Professor Wooldridge very much for the masterly manner in which he had introduced a subject which was of so great importance to all of them. He (Mr. Hines) thought that they were too apt to treat contagious abortion as a separate entity—a disease in itself, whereas it was of course only one of a long chain of pathological conditions which arose after the entrance of *Brucella abortus* into the system. When they considered that chain—abortion, retained afterbirth, metritis, mastitis, rheumatism and other obscure conditions, sterility, loss of milk, and calf loss—they would realise something of the importance of the condition to themselves, and its tremendous importance, from an economic point of view, to the farmer.

Then there was the question of contagious abortion and its relation to undulant fever in man. There seemed to be no doubt that the connection was established, and that medical officers of health being aware of the fact, it would be advanced as a further argument for the pasteurisation of milk.

Continuing, the President said that when they came to methods of treatment he thought that things were not very satisfactory. He did not think that drugs were of any use at all in the treatment of the condition, while the objection to the use of the living vaccine was that no attempt was made to eliminate the disease; in fact, it might be the means of spreading it still further. The employment of the dead vaccine seemed to be useful at times, but they did not really know how far the good results were due to the use of the vaccine or to the natural decline in the malignancy of the disease.

It seemed to him that the best method of approach in the light of present knowledge was the agglutination test, the eradication or segregation of the affected animals, and the widespread use of the principles of disinfection and sanitation. Particular care should be taken with new arrivals. In this as in other conditions a self-contained herd was the ideal to be worked for.

He was surprised to hear Professor Wooldridge advocate repeated irrigations of the uterus in cases of retained afterbirth and metritis. The mucous membrane of the uterus was a very delicate structure and was already in an unhealthy and inflamed state. In his experience irrigations had given unfortunate results, probably due to the difficulty in syphoning off the injected fluid, which often acted as an irritant on an already inflamed membrane.

He had an experience some time ago in a pedigree herd where there was a very severe outbreak of the disease. Practically all of the aborters had retained afterbirths; some he took away and some he left in, some he syringed out and in others he inserted pessaries, but always with the same results—septic metritis and a number of deaths. He consulted Mr. Lang, who suggested the use of salt by the stomach tube or its direct application to the womb. Not being particularly expert with the tube he decided to try what salt packs would do. Bags were made of butter muslin and packed with salt, securely taped at the open end and inserted into the uterus, with the tape sufficiently long to protrude from the lips of the vulva, instructions being given that the bag should be drawn out the next day. The salt slowly dissolved and the bag came out empty. Since using this method he had no further trouble and thought it far preferable to irrigation. Putrefaction seemed to be kept completely in abeyance, and he did not take the afterbirth away until he was sure that it had separated from the cotyledons.

Mr. Hudson said that, at the outset, he must disagree with Professor Wooldridge in the matter of frequent irrigation of the uterus, regarding the process of putrefaction or dissolution as more helpful in getting rid of infection. They might have to help in some cases of offensive discharge, but as routine treatment he did not agree with irrigations.

He was in favour of dead vaccines, using them in increasing doses at longer intervals, and suggested the use of live vaccines for young heifers on infected farms and also for empty cows, allowing at least two months before service. He used Nocard's hydrarg. perchlor. injection, taking care that the injection should be retained.

Continuing, Mr. Hudson said that although the use of any drug seemed to be followed by no good results, he thought that they should continue in their use in the hope that some agent or combination of agents might be found, which had some influence on the disease. Lime, he thought, was the most valuable disinfectant for use in the cow-house or on the land.

He would also emphasise the frequency with which the disease was introduced by infected calves, and felt sure that the bull was a big source of infection. The prepuce should be syringed out after service, and when an animal was used for public service this should be compulsory.

The use of the abortoscope was, in his view, satisfactory and time saving. At the International Veterinary Congress the *Br. abortus* was described as being too small to be recognised microscopically, although he had always taken the clumping of bacilli to be seen in the stomach of an aborted calf to be diagnostic.

Mr. Gooch, Senr., said that for some time he had given up the use of all vaccines; he was doubtful as to their value and the expense in many cases prohibited their use. He was in favour of irrigation, and agreed with the necessity for repeated testing.

Mr. Porter-Smith observed that he had heard

it asked if irrigation or vaccination had any effect on the incidence of sterility. He thought not; sterility seemed to occur whatever they did.

Mr. Lockwood raised the question as to how far the bull was likely to be an agent of infection.

Professor Wooldridge, in reply, said that he was sure that the bull was capable of transmitting the disease: he might transfer it from a cow that had aborted to the next one for service, or he could do so functionally through the seminal fluid. Replying to other points raised, Professor Wooldridge said that the use of live vaccine was, in his view, only desirable in exceptional cases; dead vaccines could be of considerable use in some cases. He stood nearly by himself in his view with regard to the value of irrigation, but he stuck to his guns—the efficacy of the method had been proved. He was, however, much impressed by the President's method of the use of salt. Such a hypertonic salt solution might be most helpful.

He was not as satisfied as the President that it had been established that *Brucella abortus* and *Brucella melitensis*, the cause of undulant fever in man, were identical. No doubt they were indistinguishable in many respects, possibly morphologically, culturally, and serologically. These might only be group characters; the crucial test was epidemiologically. People had for years been drinking milk containing *Br. abortus* without the slightest suspicion of undulant or Malta fever. He considered that the danger was greatly exaggerated.

H. C. Reeks, *Hon. Secretary.*

TAXATION OF STUD HORSE EARNINGS

A judgment of considerable interest to horse breeders was given in the Court of Appeal in London recently. The appeal was by Lord Glanely, the well-known owner and breeder of blood stock, and what he sought to contend was that stud fees earned at his horse-breeding establishment at Newmarket were not assessable for Income Tax under schedule D, but under schedule B, as part of his activities as an occupier of land. Lord Glanely holds some 888 acres of land, and owned, amongst other noted horses, Grand Parade, commanding a stud fee of 400 guineas. Apart from his income from stud fees his lordship sustained an annual loss of something like £18,000, and he naturally regarded it as a hardship that the Income Tax Commissioners should regard the letting out of stallions as a severable activity and not as part and parcel of his occupation of the land. The appeal was lost, two of the judges holding that the letting out of stallions was not a trade arising out of the occupation of the land and was, therefore, liable to Income Tax by itself. Lord Justice Romer dissented.

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Eight horses belonging to a gypsy encampment at Abbey Wood, Woolwich, strayed on to the Southern Railway line there on Saturday last, and three were killed by electricity. Trains were delayed for about an hour.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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DIARY OF EVENTS

Aug. 29th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

Aug. 31st.—Meeting of the Midland Counties Division, N.V.M.A., at Birmingham.

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Chief Veterinary Officer of the Ministry of Agriculture

Mr. P. J. L. Kelland Succeeds Sir Ralph Jackson

The Minister of Agriculture and Fisheries has appointed Mr. P. J. L. Kelland, M.R.C.V.S., Deputy Chief Veterinary Officer, to be Chief Veterinary Officer of the Ministry in succession to Sir Ralph Jackson, M.R.C.V.S., who has retired from the public service on reaching the age limit.

The above announcement was made very shortly before we went to Press with this issue, and more adequate notice of this important appointment must be postponed to our next number. In the meantime, in the name of his professional colleagues on the Ministry staff and all others, we extend our warmest congratulations to Mr. Kelland on his promotion to the headship of his Department.

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Army Veterinary Service

Appointment of Assistant Director-General

Major Sydney L. Slocock, M.C., was, on Wednesday of last week, gazetted as Assistant Director-General, Army Veterinary Services, at the War Office. Major Slocock mobilised with the Special Reserve in 1914 and joined the A.V.C. a year later in France, where he was mentioned and decorated. From the Western Front he was sent to India for the Afghan campaign and went on from there to the Malabar operations in 1921-22. He became major in the R.A.V.C. in 1925 and afterwards served in Egypt, returning to England at the end of last year.

Major Slocock is the only son of the late Mr. S. H. Slocock, who was in practice as a veterinary surgeon over a large area of South and West Middlesex.

Major Slocock is a Fellow of the Royal College of Veterinary Surgeons, of which his father was President in 1924-5.

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Major-General W. D. Smith

Major-General William Dunlop Smith, C.B., C.M.G., D.S.O., this week completes his Army service and liability for recall and is gazetted out of the Reserve at 67. He retired in 1925 after being Director-General of Army Veterinary Services at the War Office for four years. He was Assistant Director at the Curragh on mobilisation and as such went to France with the 5th Division,

and was assistant or Deputy Director on the Lines of Communication with the First Army and with Force "D." In Mesopotamia he was Director of Veterinary Services and was mentioned five times. In his earlier service he was with the Dongola and Nile expeditions, 1896-98, and in the South African War.

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Alfort Veterinary School

VISIT OF BRITISH PRACTITIONERS AND STUDENTS

On July 23rd the fifth *Veterinary Journal* trip left London for Paris, the main object of the trip being to visit the Alfort Veterinary School where considerable extensions have been made to the existing buildings.

The party, which included both practitioners and students, numbered twenty-two, including among others our indefatigable organiser and leader Principal Hobday, Professors Wooldridge and McCunn, Miss Cust, Major Dalling, Captain Bushman, and Mr. and Mrs. Powell (of London College Architectural Staff). We owe a great deal to Principal Hobday for the arrangements which had been made for our comfort.

On arrival at Paris on Sunday morning our first thought was typically British—breakfast; after which some took advantage of the time to see The Louvre and other places of interest. In the afternoon a tour by coach had been arranged, and this was much appreciated by those who were visiting Paris for the first time. The afternoon concluded with a visit to the Tomb of Pasteur, a magnificent monument worthy of a great scientist. On the following morning an early start was made to Alfort and we were met by Dr. Nicolas, who kindly acted as guide. So much was seen and noted that one cannot go into details, but the Library and Museum must rank as one of the finest in the world which is devoted to Veterinary Science. It was with difficulty that members of the party were made to leave this part of the buildings. I fear that some members of our party received rather a shock on coming to close quarters with foot-and-mouth disease, which was demonstrated to us. Lunch was taken at the Paris "Zoo" in company with Drs. Nicolas, Panisset, and Robin; after which some of the party went to the abattoirs, and others on excursions into the unknown. In the evening we left Paris and arrived in London on Tuesday morning after a memorable and enjoyable trip.

REX WILLETT.

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Edinburgh Degree in Veterinary Science

At the recent Examinations for the Degree of B.Sc. in Veterinary Science conferred by the University of Edinburgh, the following passed in the respective examinations:—

Chemistry.—Kenneth P. Anderson, William M. Henderson, John R. Ward, Pefer J. Wilson.

Physics. — Kenneth P. Anderson, Phillip Bannister, William M. Brownlie, George F. Defferary, Charles A. P. Donaldson, Reginald Ford, Stanley T. Harriss, William M. Henderson, James S. J. Lauder, Samuel B. Littler, David L. Thomson, Peter J. Wilson.

Botany. — Kenneth P. Anderson, Phillip Bannister, William M. Brownlie, George F. Defferary, William G. Dent, Campbell Dickson, Charles A. P. Donaldson, Reginald Ford, Ronald Gardiner, Stanley T. Harriss, John G. K. Henderson, William M. Henderson, Kenneth M. Jobson, James S. J. Lauder, Samuel B. Littler, Duncan J. Macpherson, James McWilliam, George Rutherford, David L. Thomson, Peter J. Wilson.

Embryology.—Kenneth P. Anderson, Phillip Bannister, William M. Brownlie, William G. Dent, Reginald Ford, Ronald Gardiner, Stanley T. Harriss, William M. Henderson, John D. M. Jack, Kenneth M. Jobson, James S. J. Lauder, Samuel B. Littler, Duncan J. Macpherson, James McWilliam, Peter J. Wilson.

Physiology. — Arthur J. Adams, Robert W. Bowman, James K. Elmslie, James A. McKinnon, Samuel G. Wilson, Alan B. Withers.

Anatomy.—William W. Wilson.

Bacteriology. — George J. Christie, James Graham, James D. Harper, M.R.C.V.S., Alexander Kelly, George B. Lewis, Robert McNeil, M.R.C.V.S., Norman P. Male, M.R.C.V.S., William Simpson.

Sanitary Science and Veterinary Hygiene.—Robert McNeil, M.R.C.V.S., Norman P. Male, M.R.C.V.S.

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New Veterinary Hospital for the North of Ireland

"The Ulster Society for the Prevention of Cruelty to Animals (Inc.) is making the first widespread public appeal in the history of its existence of almost a century, as it stands at the threshold of another important undertaking," says the *Irish Times* of August 6th. "This is the foundation of a veterinary hospital, which will be opened by Viscount Craigavon on August 23rd.

"The Society has acquired portion of an estate situated at Whiteabbey on the main road between Belfast and Carrickfergus. Here has been established a veterinary hospital for sick animals of the poor, with provision for paying patients; a convalescent home for animals, a home of rest for aged favourite animals whose owners may have to leave them for a while, and a cemetery for our dead dumb friends.

"The establishment of larger premises has become doubly necessary as a result of an important and generous scheme which recently has been completed by the National Veterinary Medical Association of Great Britain in co-operation with the North of Ireland Veterinary Medical Association and the Ulster Society for Prevention of Cruelty to Animals, under which members of the veterinary profession will give their skilled advice and treatment free, under certain conditions, at all clinics established by the Ulster Society throughout Northern Ireland. At these clinics animals requiring prolonged treatment will be sent by motor ambulance to the hospital at Whiteabbey, which will thus constitute a central institution open to the province fit to deal with the demands of the province and supported by the province.

"Viscountess Craigavon has consented to be patroness of this hospital, and Lady Coates president, and to assist them a special committee will be appointed. The resident veterinary surgeon is Captain James A. Bradley, M.R.C.V.S., who for the past seven years has been in practice in Londonderry."

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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THE NUTRITION FACTOR IN ABORTION

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I was interested in an abstract from "Wisconsin University Research Bulletin No. 112," which appears on page 905 of the *Veterinary Record*. The authors are my old friends Drs. Hart and Hadley together with Dr. Humphrey. The object was to find out, if possible, whether extra nutriment fed to cattle

inhibited or prevented abortion. From their figures it seems that the cows which got most concentrates had the largest percentage of abortions.

With the finding, the older veterinary surgeons will agree, especially those who practised in cities 40 or 50 years ago and before dairymen were compelled to move their herds into the country; for such dairymen kept their cows closely housed and fed on a rich protein diet, mostly in the form of cotton-seed cake (a feed which at that time was cheap, produced rich milk and kept the cows fit for the butcher). Cows kept and fed in this way were very prone to abort, and when mated usually failed to breed.

Were toxins formed as the result of undigested proteins, and did these toxins interfere with the growth and health of protective bacteria or the opsonins of the blood and in that way did they allow the abortion organisms to get out of control?

Some of my friends think that malted barley or brewers' grains if mixed in small quantities with the ordinary concentrates have the effect of inhibiting the activities of the *Br. abortus*. Perhaps in future feeding experiments this may be tried.

(Another American friend of mine would say: "There is too much research work done in trying to kill the 'bug' by poisoning him with his own juice, and not enough work in trying to find his natural enemy in the body," for, as he says: "Every 'bug' in nature has its 'anti-bug,' and the thing to do is to keep the 'anti-bugs' healthy and they will soon make short work of the 'bugs.'")

Whatever we may think of our friends' ideas, there is no doubt that we do not make a close enough study of the workings of nature. If we would do this with animals in the wild and try and treat our domesticated animals according to nature's plan, we might in time be able to place in them a resistance equal to their wild brothers (animals, like men, possess units that are immune and resist infection from any natural source. Why should we not select these to breed from?)

I am of opinion that many of our troublesome diseases could be eradicated if we only understood how to breed and treat our animals so that they could become the host of the so-called protective bacteria.

There is another point I should like to make and that is that certain bacteria are benign in one district or at one time of the year and virulent at another or in another district. This has been noticed in pneumonia in sheep and in Johne's disease in cattle. Why is there no Johne's disease in Ireland or Scotland? What is the factor or factors in the South of England which enables the bacillus to thrive in the cattle there?

I respectfully suggest that our research workers have taken hold of the wrong end of the stick.

Yours faithfully,

J. Gregg.

Belfast.
August 8th, 1932.

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PLASTER CASTS OF THE FOOT OF THE HORSE

To the Editor of the Veterinary Record.

Sir,—I wonder if the following would interest your readers. Recently I took a plaster cast of a pony's foot, my object being to see if it was possible to obtain a cast that would enable one to observe any abnormality in shape. This I found possible. A cast taken at intervals would show any change in shape and size of the foot. It seems so perfect that shoes could be made to the cast that would fit perfectly the foot from which the cast was made. I think this would be useful in cases of racehorses travelling or where reserve shoes would be valuable in case of accident when travelling. If any of your readers would like to see the cast I shall be glad to forward it to them.

Yours faithfully,

F. D. Neal.

594, Brighton Road,
Purley, Surrey.
August 10th, 1932.

Diseases of Animals Acts, 1894 to 1927

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 31st July, 1932	3	3	—	—	5	6	3	40	25
Corresponding period in 1931	18	30	—	—	8	9	6	67	20
1930	6	11	—	—	8	11	—	81	36
1929	20	33	—	—	6	6	6	141	97
Total 1st January to 31st July, 1932	237	292	3	227	88	148	136	1,141	554
Corresponding period in 1931	313	345	74	8,237	102	169	191	1,216	506
1930	239	262	—	—	161	241	258	1,560	638
1929	279	327	23	1,895	148	311	339	1,314	785